

---

# Diversification of Camera Technology in Support of Varied Wavefront Sensing Applications

Tom Seccull\*<sup>1</sup>

<sup>1</sup>Oxford Instruments Andor, 7 Millennium Way, Springvale Business Park, Belfast, BT12 7AL, UK – United Kingdom

## Abstract

Adoption of wavefront sensing instrumentation is increasing at optical and near-infrared ground-based observatories of all scales and configurations as a critical component of adaptive optics systems that push the performance of telescopes toward their theoretical limit. The sizes, designs, ages, instruments, and science applications of each observatory can vary significantly, however, and their requirements from a wavefront sensing camera are equally diverse in terms of frame rate, field of view, and wavelength coverage. To meet the varied wavefront sensing needs of the astronomical community, robust high-speed low-noise cameras have been developed in a range of formats based on multiple remote sensing technologies. EMCCD and sCMOS sensors are installed in the fastest and most sensitive optical wavefront sensing cameras, while the integration of InGaAs and e-MCT sensors has introduced extremely high-performance wavefront sensing capability at near-infrared wavelengths. In its many forms, wavefront sensing instrumentation is routinely aiding delivery of increased spatial resolution and signal-to-noise ratio in astronomical imaging, spectroscopy, and interferometry at telescopes with apertures above 1 m.

**Keywords:** wavefront sensing, camera, detectors, EMCCD, sCMOS, InGaAs

---

\*Speaker